IN THE CLAIMS

Please amend claims 2, 7, 15, 24, 25, 30 and 31 as indicated.

1. (Original) An apparatus for monitoring the condition of a tire comprising:

a pair of sensors comprising a first and a second thermal sensor each to be carried by a vehicle, the first thermal sensor for sensing the temperature difference between a first and second location on the tire, the second thermal sensor for sensing the temperature difference between a third and fourth location on the tire;

a signal processing device in communication with the first and second thermal sensors, the signal processing device for producing a processing device output signal representative of a potential damage condition of the tire; and

an indication device in communication with the signal processing device for indicating to a user of the vehicle that the tire is experiencing the potential damage condition.

2. (Currently Amended) The apparatus of claim 1, wherein the processing device output signal is produced in response to either a particular temperature difference between the first and second locations or ~~to~~ a particular temperature difference between the third and fourth locations.

3. (Original) The apparatus of claim 2, wherein the particular temperature difference is at least five degrees Celsius.

4. (Original) The apparatus of claim 1, wherein:

the first and second locations are on the outer surface of the tire at a location proximate to a first side edge of a radial belt section of the tire, the second location circumferentially spaced from the first location; and

the third and fourth locations are on the outer surface of the tire at a location proximate to a second side edge of a radial belt section of the tire, the fourth location circumferentially spaced from the third location.

5. (Original) The apparatus of claim 1, wherein the first and second thermal sensors are

infrared sensors.

6. (Original) The apparatus of claim 1, wherein the first and second thermal sensors are configured to measure over a fifty millisecond time period at least a five degree Celsius temperature difference between the first and second locations and at least a five degree Celsius temperature difference between the third and fourth locations.

7. (Currently Amended) The apparatus of claim 1, wherein the signal processing device is configured to produce the processing device output signal representative of a potential damage condition of the tire only when at least an approximately five degree Celsius temperature difference between the first and second ~~location~~ locations or at least a five degree Celsius temperature difference between the third and fourth locations occurs for a time period greater than approximately ten minutes.

8. (Original) The apparatus of claim 1, wherein the signal processing device is configured to produce the processing device output signal representative of a potential damage condition of the tire only when at least a five degree Celsius temperature spike is sensed by one of the first or second thermal sensors, and the spike lasts for an increasingly longer amount of time over a predetermined time period.

9. (Original) The apparatus of claim 1, wherein the signal processing device is configured to produce the processing device output signal representative of a potential damage condition of the tire only when an increasing temperature difference between the first and second locations or an increasing temperature difference between the third and fourth locations occurs over a predetermined amount of time.

10. (Original) The apparatus of claim 1, wherein the indication device is selected from the group consisting of a lamp, a light emitting diode, a gage, and an audio indicator.

11. (Original) An apparatus for monitoring the condition of a tire,

the tire having a first and second location on the outer surface of the tire at a location proximate to a first side edge of a radial belt section of the tire, the second location on the outer surface of the tire and circumferentially spaced from the first location, the tire having a third and fourth location on the outer surface of the tire at a location proximate to a second side edge of the radial belt section of the tire, the fourth location on the outer surface of the tire circumferentially spaced from the third location; the apparatus comprising:

a pair of sensors comprising a first and a second thermal sensor each being carried by the vehicle, the first thermal sensor for sensing the temperature difference between the first and second locations on the tire, the second thermal sensor for sensing the temperature difference between the third and fourth locations on the tire;

a signal processing device in communication with the first and second thermal sensors, the signal processing device generating a processing device output signal representative of a potential damage condition of the tire, the processing device output signal being produced when at least an approximately five degree Celsius temperature difference between the first and second locations or at least an approximately five degree Celsius temperature difference between the third and fourth locations occurs for a time period greater than approximately ten minutes; and

an indication device in communication with the signal processing device for indicating to a user of the vehicle that the tire is experiencing the potential damage condition.

12. (Original) An apparatus for monitoring the condition of a tire comprising:

a first thermal sensor carried by a vehicle, the first thermal sensor for producing a first sensor output signal representative of the temperature of a first location on a tire, and a second sensor output signal representative of the temperature of a second location on the tire;

a signal processing device for receiving the first and second sensor output signals, the signal processing device producing a processing device output signal representative of a potential damage condition of the tire in response to a particular temperature difference between the first and second locations as indicated by the first and second sensor output signals; and

an indication device for receiving the processing device output signal and indicating to a user of the vehicle that the tire is experiencing the potential damage condition.

13. (Original) The apparatus of claim 12, wherein the particular temperature difference is at least five degrees Celsius.

14. (Original) The apparatus of claim 12, wherein the first and second locations are on the outer surface of the tire at a location proximate to a first side edge of a radial belt section of the tire, the second location is circumferentially spaced from the first location.

15. (Currently Amended) The apparatus of claim 12, further comprising a second thermal sensor to be carried by the vehicle, the second thermal sensor producing a third sensor output signal representative of the temperature of a third location on the tire, and a fourth sensor output signal representative of the temperature of a fourth location ~~in~~ on the tire;

wherein the signal processing device receiving the third and fourth sensor output ~~signal~~ signals, and producing the processing device output signal in response to a particular temperature difference between the third and fourth locations as indicated by the third and fourth sensor output signals.

16. (Original) The apparatus of claim 15, wherein the temperature difference between the third and fourth locations is at least five degrees Celsius.

17. (Original) The apparatus of claim 15, wherein the third and fourth locations are on the outer surface of the tire at a location proximate to a second side edge of a radial belt section of the tire, the fourth location is circumferentially spaced from the third location.

18. (Original) The apparatus of claim 12, wherein the first thermal sensor is an infrared sensor.

19. (Original) The apparatus of claim 12, wherein the thermal sensor is configured for

measuring over a fifty millisecond time period at least a five degree Celsius temperature difference between the first and second locations.

20. (Original) The apparatus of claim 12, wherein the signal processing device produces the processing device output signal representative of a potential damage condition of the tire only when at least an approximately five degree Celsius temperature difference between the first and second locations occurs for a time period greater than approximately ten minutes.

21. (Original) The apparatus of claim 12, wherein the signal processing device produces the processing device output signal representative of a potential damage condition of the tire only when at least a five degree Celsius temperature spike is sensed by the first thermal sensor, and the spike lasts for an increasingly longer amount of time over a predetermined time period.

22. (Original) The apparatus of claim 12, wherein the signal processing device produces the processing device output signal representative of a potential damage condition of the tire only when an increasing temperature difference between the first and second locations occurs over a predetermined amount of time.

23. (Original) The apparatus of claim 12, wherein the indication device is selected from the group consisting of a lamp, a light emitting diode, a gage, and an audio indicator.

24. Currently Amended) An apparatus for monitoring the condition of a tire comprising:

a thermal array to be carried by a vehicle, the thermal array producing a first array location output signal representative of the temperature of a first array location on a tire, the thermal array producing a second array location output signal representative of the temperature of a second array location on the tire;

a signal processing device receiving the first and second array location output signals, the signal processing device producing a processing device output signal representative of a potential damage condition of the tire in response to a particular temperature difference between the first and second array locations as indicated by the first and second array location output signals; and

an indication device receiving the processing device output signal and indicating to a user of the vehicle that the tire is experiencing the potential damage condition.

25. (Currently Amended) A method for monitoring the condition of a tire, comprising:

producing a first sensor output signal representative of the temperature at a first location on the outer surface of a tire;

producing a second sensor output signal representative of the temperature at a second location on the tire;

receiving the first and second sensor output signals;

producing a processing device output signal representative of a potential damage condition of the tire in response to a particular temperature difference indicated by the first and second sensor output signals; and

indicating to a user that the tire is experiencing the potential damage condition in response to the processing device output signal.

26. (Original) The method as set forth in claim 25, further comprising the steps of:

producing a third sensor output signal representative of the temperature at a third location on the tire;

producing a fourth sensor output signal representative of the temperature at a fourth location on the tire; and

producing a processing device output signal representative of a potential damage condition of the tire in response to a particular temperature difference indicated by the third and fourth output signals.

27. (Original) An apparatus for monitoring the condition of a tire, comprising:

a pair of sensors comprising a first and a second thermal sensor each carried by a vehicle, the first and second thermal sensors sensing the temperature at different locations on the tire;

a signal processing device in communication with the first and second thermal sensors, the signal processing device producing a processing device output signal representative of a potential damage condition of the tire; and

an indicator device in communication with the signal processing device and indicating to a user of the vehicle that the tire is experiencing the potential damage condition.

28. (Original) The apparatus of claim 27, wherein the processing device output signal is produced in response to a particular temperature difference between the temperature sensed by the first thermal sensor and the temperature sensed by the second thermal sensor.

29. (Original) The apparatus of claim 28, wherein the particular temperature difference is at least 5 degree Celsius.

30. Currently Amended) The apparatus of claim 27, wherein the signal processing device output signal representative of a potential damage condition of the tire is produced only when at least an approximately 5 degree Celsius temperature difference ~~exists~~ existing between temperatures measured by the first and second thermal sensors occurs for a time period greater than approximately 10 minutes.

31. An apparatus for monitoring the condition of a tire, comprising:

at least two sensors carried by a vehicle and positioned so as to sense the temperature at locations on at least two different tires of the vehicle such that the sensors are configured for measuring the temperature difference between different locations on one tire and for measuring the temperature difference between different locations on the other tire;

a signal processing device in communication with the sensors, the signal processing device producing a processing device output signal representative of a potential damage condition of ~~the~~ a tire; and

an indicator device in communication with the signal processing device and indicating to a user of the vehicle that at least one tire is experiencing the potential damage condition.

32. (Original) The apparatus of claim 31, wherein at least four sensors are carried by the vehicle and positioned so as to sense the temperature at locations on four different tires of the vehicle.

33. (Original) The apparatus of claim 31, wherein the temperature at locations on both of the front tires of the vehicle are measured, and wherein the processing device output signal representative of a potential damage condition of the tire is produced upon comparison of the temperatures measured on the two different front tires of the vehicle.

34. (Original) The apparatus of claim 31, wherein the temperature at locations on the two back tires of the vehicle are measured, and wherein the processing device output signal representative of a potential damage condition of the tire is produced based on the temperatures sensed on the two different back tires of the vehicle.